STATE OF CALIFORNIA

DEPARTMENT OF WATER RESOURCES
DIVISION OF RESOURCES PLANNING

———————o———————

THIRD SUPPLEMENT
TO
STATE WATER RESOURCES BOARD BULLETIN NO. 11

SAN JOAQUIN COUNTY INVESTIGATION

BASIC DATA

CALAVERAS UNIT
1956-57

———————o———————

GOODWIN J. KNIGHT
Governor

HARVEY O. BANKS
Director of Water Resources

January, 1958

STATE OF CALIFORNIA

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Director of Water Resources

January, 1958

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STATE OF CALIFORNIA
Department of Water Resources
SACRAMENTO

January 21, 1958

Stockton and East San Joaquin
Water Conservation District
Bank of America Building
Stockton, California

Gentlemen:

There is transmitted herewith the Third Supplement to State Water Resources Board Bulletin No. 11, "San Joaquin County Investigation".

Bulletin No. 11 contains an inventory of water supply, water utilization, cost estimates and plans for water development works in the Calaveras River, Mokelumne River, and Farmington-Collegeville areas in San Joaquin County.

This supplement contains basic hydrologic data for the period fall 1956, through spring 1957. The agreement for this fiscal year, as in the case of the preceding year, provides for the collection of basic data in the Calaveras Unit only.

The data were collected and this supplement prepared in accordance with the terms of a cooperative agreement entered into October 1, 1956, between the Department of Water Resources and the Stockton and East San Joaquin Water Conservation District.

Very truly yours,

HARVEY O. BANKS
Director

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AUTHORIZATION

This third supplement to State Water Resources Board Bulletin No. 11, "San Joaquin County Investigation", was prepared in accordance with the terms of an agreement entered into as of October 1, 1956, between the Department of Water Resources and the Stockton and East San Joaquin Water Conservation District. A copy of this agreement and of an amendment thereto, entered into October 2, 1956, are included in the appendix of this report.

SCOPE

The work performed consisted of the measurement of stream flows and ground-water levels and the sampling and mineral analysis of ground waters in the Calaveras Unit during the fall of 1956 and through the spring of 1957.

The similar basic data collected prior to 1956 and descriptions of the wells in which the water levels were measured, have been published heretofore in the First and Second Supplements to Bulletin No. 11 dated May 1956 and April 1957, respectively.

Table 1 of this supplement contains a tabulation of depths to ground water measured at selected wells throughout the Unit. Reference point elevations listed to tenths of a foot were determined by differential levels, whereas elevations reported to the nearest foot were obtained by interpolation from topographic maps. Table 2 contains description of wells not previously published.

Partial and complete mineral analyses of ground water are presented in Tables 3 and 4, respectively. As noted in Bulletin No. 11, the quality of ground water throughout the Calaveras Unit generally is excellent, with the

exception of the water in certain deep wells in the vicinity of Stockton. Therefore, the analyses listed in the aforementioned tables have been confined largely to the ground waters in the area of these deep wells.

Tables 5 through 10 give the daily flow during the 1956 calendar year at gaging stations on the Calaveras River, Mormon Slough, Stockton Diverting Canal and Duck Creek. These records are preliminary and subject to revision. Final 1956 records of runoff, stream diversions, and complete mineral analyses of water samples from the Calaveras River at Jenny Lind will be published in the 1956 "Report of Sacramento-San Joaquin Water Supervision", an annual publication of the Department of Water Resources.

Plate 1 delineates the location of wells and gaging stations at which the data reported herein were obtained. Plate 2 depicts hydrographs showing the fluctuation in elevation of water levels in selected wells in the Calaveras Unit during the period of record.

TABLE 1

DEPTHS TO GROUND WATER

IN CALAVERAS UNIT

FALL OF 1956 AND SPRING OF 1957

TABLE 1

DEPTHS TO GROUND WATER IN CALAVERAS UNIT
FALL OF 1956 AND SPRING OF 1957

Well number and R. P. elev.[a]	Date	Dist. R. P. to water surface, in feet
3N/7E-25C1	--	--
73	3-20-57	55.5
3N/7E-25G1	10-29-56	64.5
75.7	3-25-57	59.0
3N/7E-31B1[b]	--	--
41	3-20-57	35.2
3N/7E-35C2	10-29-56	53.8
62.2	3-25-57	48.9
3N/7E-35L1	10-29-56	55.2
64.5	3-25-57	49.6
3N/7E-36D1	10-29-56	56.4
68.7	3-25-57	52.4
3N/7E-36K1	10-29-56	65.5
78.2	3-25-57	59.7
3N/8E-29G1	10-29-56	77.9
93	3-25-57	66.6
3N/8E-30H1	10-29-56	72.2
85.3	3-25-57	65.5
3N/8E-32P1	10-29-56	72.3
85.6	3-25-57	67.0
3N/9E-25R1	10-25-56	37.6
170.0	3-25-57	37.6
3N/9E-33J1	10-25-56	60.7
142	3-26-57	60.5
3N/9E-35H1	10-25-56	47.8
163	3-25-57	47.1
3N/9E-36G1	10-25-56	61.0
181.2	3-26-57	60.4
3N/10E-31M1	10-25-56	66.2
191	3-26-57	69.2
2N/6E-12H1	10-23-56	24.2
34.2	3-25-57	27.0
2N/6E-13M1	10-23-56	18.2
27.2	3-25-57	22.9
2N/6E-13R1	10-23-56	24.2
30.8	3-25-57	18.2
2N/6E-15J1	10-23-56	12.0
21	3-25-57	16.9
2N/6E-24J2	10-23-56	31.3
30.7	3-25-57	28.9
2N/6E-26H1	10-23-56	30.6
23.0	3-25-57	27.5
2N/6E-26L2	10-23-56	31.1
21.7	3-25-57	28.9
2N/6E-34K1[c]	10-28-56	38
8.8	2-26-57	30
2N/6E-36A1[c]	10-28-56	70
25.6	2-26-57	41
2N/6E-36R3[c]	10-28-56	55
23.9	2-26-57	50
2N/7E-1R2	10-24-56	64.2
74	3-25-57	60.5
2N/7E-3N3	10-24-56	53.2
56.3	3-25-57	43.3
2N/7E-5E1	10-23-56	38.4
41.5	3-25-57	34.8

TABLE 1 (Continued)

DEPTHS TO GROUND WATER IN CALAVERAS UNIT
FALL OF 1956 AND SPRING OF 1957

Well number and R. P. elev.[a]	Date	Dist. R. P. to water surface, in feet
2N/7E-5R1	10-23-56	47.1
46.6	3-25-57	40.8
2N/7E-8D1	10-23-56	38.4
42.8	3-25-57	36.8
2N/7E-8K3	10-23-56	47.6
45.0	3-25-57	41.1
2N/7E-9B2	10-23-56	52.0
54.6	3-25-57	46.3
2N/7E-11H1	10-23-56	59.3
62.7	3-25-57	54.7
2N/7E-12A1[b]	10-31-56	65.0
71	--	--
2N/7E-14P1	10-23-56	56.1
58.2	3-25-57	51.4
2N/7E-15C1	10-24-56	61.8
51.7	3-25-57	49.6
2N/7E-16L1	10-23-56	54.2
47.7	3-25-57	46.4
2N/7E-18K1	10-23-56	36.9
36.5	3-25-57	33.4
2N/7E-20M1	10-23-56	43.0
37.0	3-25-57	39.4
2N/7E-23J2	10-23-56	65.8
60.4	3-25-57	55.1
2N/7E-24B1	10-24-56	65.1
65.9	3-25-57	57.5
2N/7E-26N1	10-24-56	59.8
50.8	3-27-57	53.1
2N/7E-27D1	10-23-56	60.8
47.5	3-27-57	53.5
2N/7E-31A1	10-24-56	48.5
30.2	3-27-57	41.3
2N/7E-31F1	10-24-56	43.5
27	3-27-57	40.2
2N/7E-32R1	10-24-56	48.8
32	3-27-57	44.9
2N/7E-33D1	--	--
37	3-27-57	50.2
2N/7E-33R1	10-24-56	49.0
39	3-27-57	47.3
2N/7E-35L	10-24-56	59.1
50.9	3-27-57	52.6
2N/7E-36H1	10-24-56	60.7
60.0	3-27-57	53.7
2N/8E-1R1[b]	--	--
114	3-26-57	45.6
2N/8E-3G2[b]	10-29-56	89.8
109.3	3-25-57	83.6
2N/8E-4C1	10-29-56	79.8
93.5	3-25-57	70.1
2N/8E-8N1	10-24-56	67.1
77.5	3-25-57	60.9
2N/8E-9G2	10-24-56	74.5
87	3-25-57	67.1
2N/8E-10H1	10-24-56	86.7
106.4	3-25-57	80.5
2N/8E-11B1	10-29-56	79.6
106.4	3-25-57	74.8
2N/8E-12L1	10-29-56	79.0
109.5	3-25-57	74.9

TABLE 1 (Continued)

DEPTHS TO GROUND WATER IN CALAVERAS UNIT
FALL OF 1956 AND SPRING OF 1957

Well number and R. P. elev.[a]	Date	Dist. R. P. to water surface, in feet
2N/8E-13K1	10-25-56	80.7
106.4	3-26-57	74.2
2N/8E-14C1	10-25-56	75.5
95	3-25-57	69.1
2N/8E-15M2	10-24-56	73.1
85.6	--	--
2N/8E-16D1	10-24-56	68.3
80.9	3-25-57	61.7
2N/8E-18C1	10-24-56	72.6
70.0	3-25-57	56.4
2N/8E-19C3	10-24-56	64.2
68.4	3-25-57	57.4
2N/8E-19P2	10-24-56	68.8
69.2	3-25-57	60.4
2N/8E-20F1	10-24-56	68.5
73.7	3-26-57	61.8
2N/8E-21R1	10-24-56	62.3
80.8	3-26-57	61.5
2N/8E-24P1	10-24-56	118.0
127	3-25-57	95.9
2N/8E-25P1	10-24-56	98.8
101.5	3-26-57	73.6
2N/8E-30H1	10-24-56	65.3
70.5	3-27-57	58.6
2N/8E-31N1	--	--
63.7	3-27-57	54.6
2N/8E-34E1	10-25-56	70.5
82.9	3-26-57	63.6
2N/8E-35C1	10-25-56	73.7
89.8	3-26-57	65.9
2N/8E-36L1	10-25-56	78.0
97.7	3-26-57	69.8
2N/9E-3A1	10-25-56	46.4
150	3-25-57	46.0
2N/9E-4H1	10-25-56	59.5
154	3-26-57	59.1
2N/9E-5H1	10-25-56	78.7
132.7	3-26-57	77.3
2N/9E-5L1	10-25-56	27.4
130.5	3-26-57	26.5
2N/9E-5N1	10-25-56	89.2
127.0	3-26-57	78.9
2N/9E-7G2	10-29-56	79.9
120	3-26-57	77.6
2N/9E-8N1[b]	--	--
138	3-26-57	101.1
2N/9E-9D1	10-25-56	79.3
133.2	3-26-57	77.9
2N/9E-17C1	--	--
193	3-26-57	149.3
2N/9E-18Q1	10-25-56	83.7
115	3-26-57	78.2
1N/6E-1J1[c]	10-28-56	70
25.2	2-26-57	59
1N/6E-3C1[c]	10-28-56	36
10.5	2-26-57	34
1N/6E-3J1[c]	10-28-56	53
13.2	2-26-57	42
1N/6E-4B1[c]	10-28-56	30
7.5	2-26-57	20

TABLE 1 (Continued)

DEPTHS TO GROUND WATER IN CALAVERAS UNIT
FALL OF 1956 AND SPRING OF 1957

Well number and R. P. elev.[a]	Date	Dist. R. P. to water surface, in feet
1N/6E-4D1[c]	10-28-56	37
5.7	2-26-57	30
1N/6E-12C3[c]	10-28-56	62
21	2-26-57	55
1N/6E-13J1[c]	10-28-56	70
20.2	2-26-57	56
1N/6E-14C1[c]	10-23-56	57
12.6	2-26-57	48
1N/6E-23J1[b]	10-30-56	29.1
18	3-19-57	26.3
1N/7E-1M1	--	--
54.8	3-27-57	49.6
1N/7E-4P3	10-24-56	52.0
34	3-27-57	47.2
1N/7E-7E1[c]	10-28-56	61
26.6	2-26-57	54
1N/7E-8F3	--	--
31.6	3-27-57	56.4
1N/7E-8R1	10-24-56	54.4
32.0	3-27-57	50.4
1N/7E-11E1	10-24-56	55.1
49.1	3-26-57	50.3
1N/7E-11G1	10-24-56	56.6
51.7	3-27-57	49.2
1N/7E-12Q1	10-24-56	64.2
56.4	--	--
1N/7E-13E1	10-31-56	51.7
52	3-19-57	49.7
1N/7E-16N1[b]	10-30-56	43.5
34	3-19-57	44.0
1N/7E-19R1	10-30-56	40.0
25	3-19-57	35.9
1N/8E-10B1	10-25-56	74.5
80	3-27-57	62.1
1N/8E-11G2[b]	10-25-56	71.8
86	3-26-57	61.8
1N/8E-13J1	10-25-56	74.0
95	3-26-57	68.6
1N/8E-14E1	--	--
85	3-27-57	63.4
1N/8E-17D1	10-25-56	68.3
69	3-19-57	58.9
1N/9E-7D1[b]	--	--
116	3-26-57	90.7

a. Reference point elevation in feet above mean sea level, U. S. G. S. datum.

b. Description of wells not previously published; see Table 2.

c. Measurements obtained from California Water Service Company.

TABLE 2

DESCRIPTIONS OF WELLS NOT PREVIOUSLY PUBLISHED

TABLE 2

DESCRIPTIONS OF WELLS NOT PREVIOUSLY PUBLISHED

3N/7E-31B1 - Reference point - top of casing, elevation 41 feet. Located 0.74 mile east of U. S. Highway 99, 110 feet north of Morse Rd.

2N/7E-12A1 - Reference point - hole in southwest side of pump base, elevation 71 feet. Located 0.25 mile west of Jack Tone Road, 75 feet south of centerline of Waterloo Road.

2N/8E-1R1 - Reference point - hole in west side of pump base, elevation 114 feet. Located 1.8 miles west of Escalon-Bellota Road, 0.7 mile north of Highway 8.

2N/8E-3G2 - Reference point - hole in pump base, elevation 109.3 feet. Located 0.65 mile east of Duncan Road, north side of Messick Road.

2N/9E-8N1 - Reference point - hole in northeast corner of pump base, elevation 138 feet. Located 1.1 miles south of Escalon-Bellota Road, 0.2 mile west of State Highway 8.

1N/6E-23J1 - Reference point - top of board over casing, elevation 18 feet. Located west side of U. S. Highway 50, 2 miles north of French Camp Road.

1N/7E-16N1 - Reference point - 2" measuring pipe, elevation 34 feet. Located 100 feet south of Mariposa Road, 0.2 mile north of Carpenter Road.

1N/8E-11G2 - Reference point - top of casing, elevation 86 feet. Located 1.45 miles south of Copperopolis Road, 0.45 mile west of Dietrich Road.

1N/9E-7D1 - Reference point - hole in northwest corner of pump base, elevation 116 feet. Located 2 miles north of Farmington Road, 175 feet east of Hewitt Avenue.

TABLE 3

PARTIAL MINERAL ANALYSES

OF GROUND WATER

IN CALAVERAS UNIT

TABLE 3

PARTIAL MINERAL ANALYSES OF GROUND WATER
IN CALAVERAS UNIT

Well number	Date sampled	Chlorides, in parts per million	Conductance, Ec x 10^6 at 25° C.
2N/6E-29N1	8-24-56	61	641
1N/6E-3H3	9-11-56	181	813
4D1	9-11-56	60	508
	9-19-57	66	538
4J1	9-11-56	90	582
	9-19-57	82	563
10E2	9-11-56	165	810
10P1	9-11-56	405	1550
	9-19-57	412	1590
10P2	7-13-56	399	1470
	9-11-56	785	2620
	9-19-57	795	2660
14C1	9-19-57	120	628
14C2	9-19-57	115	618
14H1	9-11-56	44	417
	9-19-57	47	437
1N/9E-18G1	8-12-57	14	225

TABLE 4

COMPLETE MINERAL ANALYSES

OF GROUND WATER

IN CALAVERAS UNIT

TABLE 4

COMPLETE MINERAL ANALYSES OF GROUND WATER
IN CALAVERAS UNIT

Well number	Date sampled	Conductance Ec x 10^6 at 25° C.	pH	Mineral constituents, in equivalents per million									Mineral constituents, in parts per million				
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B	SiO_2	Total hardness as $CaCO_3$	Per cent Na
2?/8E-10C1	8-12-57	278	6.8	1.40	0.88	0.52	0.08	0	2.44	0.25	0.14	0.06	0.20	0.87	56	114	18
1N/6E-3H3	6-27-57	655	7.0	1.05	0.81	4.35	0.04	0	2.75	0.05	3.36	0	0.40	0.54	49	93	70
4D1	6-27-57	416	7.3	0.42	0.30	4.48	0.04	0	3.44	0.03	1.80	0	0	0.62	58	36	85
10E2	6-27-57	923	7.6	1.40	0.82	6.61	0.03	0	3.06	0.29	5.33	0	0.40	0.49	37	111	75
10P1	6-27-57	2230	6.7	5.29	4.10	15.53	0.13	0	2.11	0.50	21.71	0.03	0.10	0.72	67	470	62
10Q2	6-27-57	1540	6.8	2.45	1.69	10.00	0.08	0	3.13	0.06	11.00	0.01	0.30	0.91	62	207	70
14C1	6-28-57	563	7.1	2.50	1.44	2.09	0.05	0	2.44	0.23	3.36	0	0.20	0.03	34	197	34
14C2	6-27-57	624	7.0	1.30	0.94	3.74	0.04	0	2.26	0.08	3.58	0	0.30	0.17	42	112	62
14H1	6-27-57	421	7.8	0.37	0.31	3.70	0.03	0	3.08	0.01	1.21	0	0.30	0.57	60	34	84
1N/7E-11J1	8-12-57	239	6.9	0.90	0.76	0.74	0.09	0	2.07	0.20	0.25	0.03	0.20	0.80	69	83	30

STREAM FLOW TABULATIONS

TABLE 5

Flow of Calaveras River at Jenny Lind - 1956

TABLE 6

Flow of Calaveras River at Bellota - 1956

TABLE 7

Flow of Calaveras River near Stockton - 1956

TABLE 8

Flow of Mormon Slough at Bellota - 1956

TABLE 9

Flow of Stockton Diverting Canal at Stockton - 1956

TABLE 10

Flow of Duck Creek near Stockton (Pock Lane) - 1956

TABLE 5

FLOW OF CALAVERAS RIVER AT JENNY LIND - 1956[a]
Daily Mean Flow in Second-Feet

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,250	775	504	4.3	7	122	199	190	140	4	49	22
2	1,200	662	476	4.3	7.4	122	204	190	130	3	47	22
3	1,000	580	1,020	4	8.6	128	202	190	120	2	37	22
4	750	524	1,200	3.4	14	126	199	180	110	2	29	24
5	1,890	480	594	2.8	14	130	204	180	120	2	25	32
6	2,740	442	81	2.5	17	142	199	180	130	2	23	57
7	2,060	411	17	2.5	16	152	199	180	130	2	25	75
8	1,690	380	14	2.2	14	171	202	180	130	2	21	56
9	1,120	355	16	2.5	16	180	204	180	130	1	20	39
10	665	334	16	2.5	14	173	204	180	130	1	20	31
11	815	317	17	4.9	18	173	204	180	130	1	20	29
12	693	305	17	7	32	190	204	180	100	1	19	27
13	585	296	17	7	46	185	202	180	95	1	19	26
14	1,280	290	17	8.2	57	190	202	180	90	1	19	26
15	3,220	260	16	8.2	64	194	204	180	100	1	20	25
16	3,900	254	14	7	83	190	204	180	100	1	20	26
17	3,220	195	14	5.8	100	178	202	180	90	1	20	25
18	2,790	22	14	5.5	114	176	199	180	55	7	20	24
19	1,800	14	12	4.9	136	176	187	180	65	7	21	24
20	1,030	14	11	4.9	138	178	169	178	60	7.5	21	25
21	942	14	9.8	4.6	138	192	169	180	45	7.5	21	28
22	830	15	9.4	4.9	138	134	167	170	40	7	21	29
23	2,010	109	8.6	4.6	138	57	160	170	35	8	21	29
24	2,000	48	7.8	5.2	142	46	162	160	55	9.5	21	39
25	1,840	148	6.7	5.5	148	45	173	160	80	12	21	35
26	2,850	380	5.8	7	144	72	182	160	20	17	21	31
27	3,530	484	4.9	7.8	140	190	180	150	6	22	21	29
28	3,240	516	4.6	7.4	138	230	180	140	5	26	22	28
29	2,720	524	4.9	7.4	134	225	180	140	5	28	22	29
30	2,570		4.9	7	128	212	180	140	4	26	22	29
31	984		4.9		124		180	140		27		29
Mean	1,852	315	134	5.19	78.3	156	191	172	81.7	7.73	23.6	31.4
Ac. Ft.	113,900	18,140	8,250	309	4,820	9,280	11,710	10,590	4,860	475	1,400	1,930
									Total Runoff in Acre-Feet			185,664

a. Preliminary data subject to revision.

TABLE 6

FLOW OF CALAVERAS RIVER AT BELLOTA - 1956[a]
Daily Mean Flow in Second-Feet

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	120[b]	160	0[b]	3.2	0	80	107[b]	122	96			0
2	109[b]	140	0[b]	1.3	0	74	128[b]	120	95			0
3	108[b]	130	0[b]	0.5	0	74	128	120	94			0
4	116[b]	122	0[b]	0	0	73	128	120	92			0
5	140[b]	117	0[b]	0	0	77	127	121	89			0
6	180[b]	112	0	0	0	81	127	119	92			0
7	180[b]	108	0	0	0	94	128	117	92			0
8	195[b]	102	0	0	0	104	128	116	90			0
9	170[b]	98	0	0	0	111	127	115	91			0
10	140[b]	95	0	0	0	110	116	119	90			0
11	130[b]	40	0	0	0	110	110	116	91			0
12	128[b]	0	0	0	0	111	110	115	90	N	N	0
13	85	0	0	0	0	110	110	115	87	0	0	0
14	140[b]	0	0	0	0.4	119	110	114	83			11
15	265[b]	0	0	0	17	125	110	113	78			17
16	305[b]	0	0	0	32	124	111	115	83	F	F	17
17	215[b]	0	0	0	40	122	111	115	81	L	L	17
18	184	0	0	0	48	108	112	114	79	O	O	16
19	174[b]	0	0	0	74	126	110	114	27	W	W	16
20	165[b]	0	0	0	89	134	104	115	0			14
21	182[b]	0	0	0	88	140	104	114	0			12
22	157[b]	0	0	0	88	47	104	110	0			12
23	176[b]	0	0	0	89	0	103	110	0			12
24	178[b]	0	0	0	86	0	103	109	0			12
25	184[b]	0	0	0.8[b]	88	0	104	108	0			12
26	200[b]	0	8.9	0.8[b]	90	7.3	107	107	0			12
27	218[b]	0	8.0	0.9[b]	90	9.6[b]	116	106	0			12
28	197	0[b]	5.4	0.8[b]	87	13[b]	111	105	0			20
29	180	0[b]	5.6	0.6[b]	83	19[b]	107	102	0			29
30	154		4.9	0.5[b]	79	25[b]	108	102	0			29
31	148		3.3		81		111	98				29
Mean	168	42.2	1.2	0.3	40.3	77.6	114	113	54.0	0	0	9.6
Ac. Ft.	10,360	2,428	72	19	2,478	4,617	6,982	6,954	3,213	C	0	593
										Total Runoff in Acre-Feet		37,716

a. Preliminary data subject to revision.
b. Estimated.

TABLE 7

FLOW OF CALAVERAS RIVER NEAR STOCKTON - 1956[a]
Daily Mean Flow in Second-Feet

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	114	141			0	24	31	5.6	24		0	0
2	103	134			0	24	36	7.8	24		0	0
3	99	122			0	16	30	9.6	18		0	0
4	108	118			0	22	38	15	15		0	0
5	116	113			0	11	40	26	13		0	0
6	171	110			0	7.4	41	28	14		0	0
7	170	107			0	6.9	46	24	14		0.6	0
8	183	104			0	8.1	51	21	17		0.4	0
9	159	101			0	18	49	13	23		0	0
10	128	99			0	23	42	10	22		0	0
11	126	95			0	14	39	14	19		0	0
12	114	18	N	N	0	9.7	36	26	19	N	0	0
13	108	0	O	O	0	3.5	36	27	18	O	0	0
14	121	0			0	2.0	34	18	15		0	0
15	236	0			0	6.4	38	18	16		0	0
16	288	0	F	F	0	6.4	32	21	22	F	0	0
17	203	0	L	L	0	13	24	22	22	L	0	0
18	172	0	O	O	0	18	22	19	28	O	0	0
19	159	0	W	W	0	3.9	20	18	25	W	0	0
20	148	0			0	0.6	16	20	12		0	0
21	170	0			16	11	17	20	2.5		0	0
22	131	0			17	11	19	18	0.3		0	0
23	166	0			23	0.6	18	18	0		0	0
24	167	0			12	0	8.1	20	0		0	0
25	172	0			27	0	7.7	22	0.5		0	0
26	183	0			32	0	8.8	20	0.3		0	0
27	201	0			33	0	9.0	27	0		0	0
28	177	0			39	0	12	18	0		0	0
29	162	0			33	0	18	23	0		0	0
30	149				32	7.0	16	24	0		0	0
31	128				25		1.5	29				3.7
Mean	156	43.5	0	0	9.3	8.9	27.0	19.4	12.8	0	0	0
Ac. Ft.	9,584	2,503	0	0	573	531	1,658	1,194	761	0	2.0	7.0
									Total Runoff in Acre-Feet			16,813

a. Preliminary data subject to revision.

FLOW OF MORMON SLOUGH AT BELLOTA - 1956[a]
Daily Mean Flow in Second-Feet

Date:	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		584	609	0	0.7	59	60	52	45	2.6	28	18
2	N	419	567	0	0.2	52	61	59	37	1.7	42	20
3	O	366	938	0[b]	2.6	78	66	57[b]	40	0.4	37	20
4		323	1,540	0[b]	3.0	66	64	57[b]	31	0.4	26	20
5	R	285	1,040	0[b]	3.4	40	62	55[b]	15	0.4	11	24
	E											
6	C	255	158	0[b]	10	40	62	55[b]	25	0.4	22	33
7	O	234	87	0[b]	11	42	64	52	39	0.4	20	64
8	R	210	48	0[b]	8.2	48	64	59	39	0.0	20	64
9	D	183	37	0[b]	6.2	73	60	61	36	0	18	50
10		168	33	0[b]	6.2	70	62	52	29	0	17	42
11		263	31	0[b]	8.2	70	62	55	32	0	17	40
12		323	29	1.0[b]	9.2	78	64	59	31	0	17	35
13	414	314	26	2.2	18	77	64	54	16	0	18	33
14	1,500	309	24	2.6	28	82	62	55	4.2	0	18	28
15	4,390	280	23	3.0	18	88	65	57	0	0	18	17
16	4,660[b]	276	20	1.3	0	84	68	57	9.6	0	20	16
17	3,630	259	18	1.6	3.3	77	65	54	2.3	0	20	16
18	2,940	103	17	3.4	29	77	68	56	0	0	20	16
19	2,030	42	14	3.0	69	66	69	59	11	0.4	20	14
20	1,170	31	13	3.0	64	61	61	57	60	1.3	20	14
21	892	28	12	1.7	23	65	56	54	50	1.7	18	16
22	741	26	10	2.2	25	107	57	52	36	1.7	17	17
23	1,800	138	9.2	2.2	32	76	54	56	30	2.2	18	17
24	2,030	103	7.2	0.6	48	55	55	56	24	2.2	18	18
25	2,040	106	7.2	0	90	28	60	55	25	3.9	17	24
26	3,240	387	2.0	0	95	10	66	49	81[b]	6.2	17	20
27	3,860[b]	549	0	1.3	94	20	52	40	6.2	12	18	17
28	3,010[b]	609	0	2.2	74	87	59	37	5.3	17	22	9.9
29	2,200[b]	622	0	2.6	65	73	68	45	3.9	18	20	0
30	1,520[b]		0	2.2	56	69	69	46	3.0	23	18	0
31	915[b]		0		61		64	49		23		0
Mean	----	269	172	1.2	31.0	63.9	62.4	53.6	25.6	3.8	20.4	23.3
Ac. Ft.	----	15,460	10,550	72	1,907	3,804	3,834	3,295	1,520	236	1,217	1,434
									Total Runoff in Acre-Feet			-------

a. Preliminary data subject to revision.
b. Estimated.

TABLE 9

FLOW OF STOCKTON DIVERTING CANAL AT STOCKTON - 1956[a]
Daily Mean Flow in Second-Feet

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,900[b]	691	555		0	0.1	19	3.2	20		0	4.8
2	1,460[b]	551	510		0	0	12	0	14		0	4.2
3	1,030[b]	456	583		0	0	7.8	0	7.8		4.1	4.8
4	893[b]	391	1,430		0	0	10	6.6	7.4		18	4.6
5	941[b]	352	1,150		0	0	14	15	0.9		7.8	6.4
6	3,850[b]	312	202		0	0	14	25	0.1		0.7	9.9
7	1,410[b]	274	92		0	0	20	8.1	0		0.1	25
8	1,180[b]	244	41		0	0	16	0.3	1.4		2.8	58
9	1,150[b]	218	26		0	0	16	3.4	5.6		3.2	49
10	1,000[b]	198	20		0	0	9.9	8.1	4.4		2.0	38
11	903[b]	213	17		0	0	14	0.1	1.4		1.0	29
12	764[b]	289	14	N	0	0	8.8	0.1	4.0	N	0.6	22
13	510	278	13	O	0	0	12	9.2	2.0	O	0.3	19
14	1,100	271	12		0	0	7.8	0.2	0.1		0.1	17
15	4,130	258	9.5		0	4.3	7.8	0	0		0.2	9.9
16	5,690	246	8.3	F	0	18	20	1.6	0	F	0	2.3
17	3,800	224	6.3	L	0	14	11	13	2.1	L	0	1.0
18	3,010	137	4.8	O	0	13	7.8	11	0.4	O	0	1.1
19	2,150	43	4.0	W	0	12	11	19	0.3	W	1.2	0.5
20	1,360	25	2.6		0	2.8	7.1	28	6.0		1.2	0
21	1,210	18	1.6		0	0.7	2.7	18	33		1.2	0
22	850	16	0.9		0	11	4.2	4.0	11		1.4	0
23	1,910	59	0.1		0	54	3.2	4.4	1.2		2.0	0.8
24	2,160	122	0		0[b]	18	0	16	0		2.6	1.4
25	2,070	63	0		0[b]	5.6	0	19	0		2.7	1.8
26	3,060	227	0		0[b]	0	1.8	15	0		2.6	6.1
27	4,180	456	0		0[b]	0	5.1	12	0		2.8	4.8
28	3,410	528	0		0[b]	0	0	1.2	0		3.2	3.0
29	2,830	551	0		0.1[b]	20	0.4	0.2	0		7.1	2.0
30	2,000		0		0.1	20	17	7.4	0		4.8	0.2
31	1,060		0		0.2		12	9.6				0
Mean	2,031	266	152	0	0	6.4	9.4	8.3	4.1	0	2.5	10.5
Ac. Ft.	124,900	15,290	9,328	0	1	384	580	513	244	0	146	648
									Total Runoff in Acre-Feet			152,034

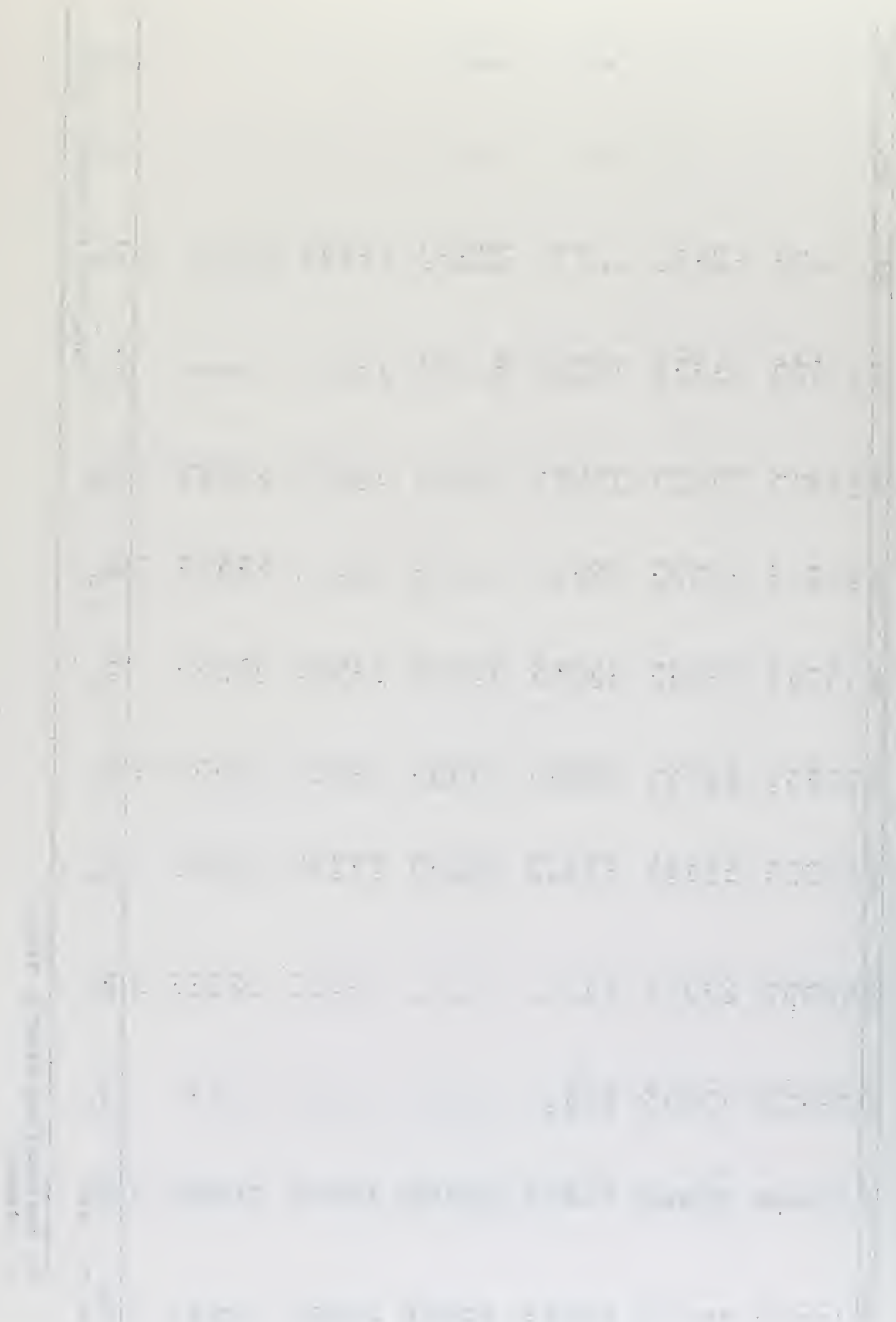
a. Preliminary data subject to revision.
b. Estimated.

TABLE 10

FLOW OF DUCK CREEK NEAR STOCKTON (POCK LANE) - 1956[a]
Daily Mean Flow in Second-Feet

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	33	8.2	0.7	0.9	0.6	1.0	0.7	0.3	0.2	0		
2	35	6.4	0.7	0.9	0.6	1.4	0.3	0.5	0.2	0		
3	36	5.4	0.6	1.2	0.8	1.1	0.1	0.4	0.4	0		
4	30	3.6	0.5	1.1	0.5	0.8	0	0.4	0.4	0.5		
5	38	2.8	0.4	0.7	0.3	0.4	0.2	0.4	1.0	0.4		
6	123	1.8	0.3	1.4	0.4	0.1	0.4	0.5	2.4	0.4		
7	71	1.2	0.2	2.0	0.4	0.4	0.3	0.7	1.8	0.3		
8	57	0.9	0.2	1.0	0.4	1.0	0.6	0.7	1.0	0.2		
9	57	0.6	0.2	0.6	0.5	1.0	0.4	1.2	0.8	0.1		
10	35	0.5	0.2	0.7	0.4	0.8	0.4	1.2	0.9	0		
11	30	0.4	0.2	1.0	0.4	0.6	0.6	0.9	0.9	0		
12	34	0.3	0.1	0.9	0.4	0.9	0.5	0.8	0.7	0	N	N
13	22	0.2[b]	0	1.1	0.3	0.3	0.2	0.7	0.2	0.1	0	0
14	27	0	0	1.4	0.3	0.4	0	0.5	0.4	0.1		
15	145	0	0	1.6	0.4	0.6	0	0.4	0.2	0		
16	183	0	0	0.9	1.3	0.9	0	0.4	0.1	0.1	F	F
17	86	0	0	0.8	0.8	0.9	0	0.2	0	0.1	L	L
18	41	0	0	0.9	1.5	0.8	0	0.2	0	0.2	O	O
19	25	0	0	0.9	5.6	0.2	0.3	0.3	0.2	0.1	W	W
20	28	0	0	1.0	6.0	1.5	0.4	0.1	0.2	0.1		
21	64	0	0	0.5	1.2	1.1	0.3	0.1	0.3	0.1		
22	45	0	0.2	0.2	0.7	1.2	0.2	0.2	0.2	0.5		
23	56	0	0.7	0.1	0.8	1.4	0.2	0.3	0	0.4		
24	52	0	1.5	0.4	1.2	0.9	0	0.8	0	0.2		
25	44	0	1.2	0.7	2.0	0.4	0	0.6	0	0.2		
26	62	0	1.3	0.5	2.4	0.5	0.6	0.4	0	0.2		
27	97	0	0.9	0.4	2.1	0.7	0.4	0.4	0	0.2		
28	53	0.6	1.3	0.9	3.0	1.0	0.5	0.4	0	0		
29	28	1.0	1.3	1.0	2.7	0.6	0.6	0.3	0	0		
30	18		1.1	0.8	2.0	0.7	0.3	0.6	0	0		
31	12		1.0		1.4		0.2	0.2		0		
Mean	53.8	1.2	0.5	0.9	1.3	0.8	0.3	0.5	0.4	0.1	0	0
Ac. Ft.	3,306	67	29	53	82	47	17	30	25	9	0	0
										Total Runoff in Acre-Feet		3,665

a. Preliminary data subject to revision.
b. Estimated.



APPENDIX A

Agreement between the Department of Water Resources and the Stockton and East San Joaquin Water Conservation District

Amendment to Agreement between the Department of Water Resources and the Stockton and East San Joaquin Water Conservation District

APPENDIX A

AGREEMENT
BETWEEN THE DEPARTMENT OF WATER RESOURCES
AND THE
STOCKTON AND EAST SAN JOAQUIN WATER CONSERVATION DISTRICT

THIS AGREEMENT, executed in quintuplicate, entered into as of October 1, 1956, by the Department of Water Resources of the State of California, hereinafter referred to as the 'Department', and the Stockton and East San Joaquin Water Conservation District, hereinafter referred to as the 'District'.

W I T N E S S E T H

WHEREAS, an investigation of the Calaveras River area in San Joaquin County has been conducted by the Department of Public Works, acting by and through the agency of the State Engineer, between February 1948 and September 1955, and the results of said investigation have been published pursuant to a cooperative arrangement between the Department of Public Works and the County of San Joaquin whereby the work accomplished, including publication of the bulletin, was financed with funds contributed equally by the County and the State of California; and

WHEREAS, funds were appropriated to the Department by Item 224 of the Budget Act of 1956 for continuing work on ground water level, stream flow measurements, and a quality of water check, in the Calaveras River Area on a matching basis, pending accomplishment of solution of the water problems in the area; and

WHEREAS, by the State Water Resources Act of 1945, as amended, the Department is authorized to make investigations, studies, surveys, prepare plans and estimates, and make recommendations to the Legislature in regard to water development projects; and

WHEREAS, by said act, the Department is authorized to cooperate with any county, city, State agency, or public district on flood control and other water problems and when requested by any thereof may enter into a cooperative agreement to expend money in behalf of any thereof to accomplish the purposes of said act; and

WHEREAS, The District desires and hereby requests the Department to enter into a cooperative agreement for the making of ground water level and stream flow measurements, and a quality of water check in the Calaveras River Area between October 1, 1956 and September 30, 1957, and prepare a supplemental report thereon:

NOW THEREFORE, in consideration of the premises and of the several promises to be faithfully performed by each as hereinafter set forth, the Department and the District do hereby mutually agree as follows:

ARTICLE I - WORK TO BE PERFORMED:

The work to be performed under this agreement shall consist of stream flow measurements and a series of ground water level measurements in the fall of 1956 and spring of 1957, a general water quality check of surface and underground waters in the Calaveras River

Area, and the compilation and preparation of a report on the results of such measurements and water quality check.

The Department agrees to proceed with the work to be performed, and to contract with the District to secure any portion of the necessary records and data required by this agreement.

During the progress of said investigation and report, all maps, plans, information, data and records pertaining thereto, which are in the possession of any party hereto, shall be made fully available to any other party for the due and proper accomplishment of the purposes and objects hereof.

The work under this agreement shall be diligently prosecuted with the objective of completion of the investigation and compilation of data and preparation of a report thereon on or before September 30, 1957, or as soon thereafter as possible.

ARTICLE II - FUNDS:

The District, upon execution by it of this agreement, shall transmit to the Department the sum of One Thousand Dollars ($1,000) for deposit, subject to the approval of the Director of Finance, into the Water Resources Revolving Fund in the State Treasury, for expenditures by the Department in performance of the work provided for in this agreement. Also,

upon execution of this agreement by the Department, the Director of Finance will be requested to approve the transfer of the sum of One Thousand Dollars ($1,000) from funds made available to the Department by Item 224 of the Budget Act of 1956, as augmented, for expenditure by the Department in performance of the work provided for in this agreement and the State Controller will be requested to make such transfer.

If the Director of Finance, within thirty (30) days after receipt by the Department of said One Thousand Dollars ($1,000) from the District, shall not have approved the deposit thereof into said Water Resources Revolving Fund, together with the transfer of the sum of said One Thousand Dollars ($1,000) from funds made available to the Department, for expenditure by the Department in performance of the work provided for in this agreement, such sum contributed by the District shall be returned thereto by the Department.

The Department shall under no circumstances be obligated to expend for or on account of the work provided for under this agreement any amount in excess of the sum of Two Thousand Dollars ($2,000) as made available hereunder and when said sum is exhausted, the Department may discontinue the work provided for in this agreement and shall not be liable or responsible for the resumption and completion thereof.

Upon completion of and final payment for the work provided for in this agreement, the Department shall furnish to the District

a statement of all expenditures made under this agreement. One-half of the total amount of all said expenditures shall be deducted from the sum advanced from funds appropriated to said Department, and one-half of the total amount of all said expenditures shall be deducted from the sum advanced by the District and any balance which may remain shall be returned to the Department, and to the District, in equal amount.

IN WITNESS WHEREOF, the parties hereto have executed this agreement to be effective as of the date hereinabove first written.

Approved as to Form and Procedure

/s/ Irving L. Neumiller
Attorney for Stockton and East San Joaquin Water Conservation

STOCKTON AND EAST SAN JOAQUIN WATER CONSERVATION DISTRICT

By /s/ J. H. Burton
Chairman, Board of Directors

Approved as to Form and Procedure

/s/ P. A. Towner
Attorney, Department of Water Resources

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

HARVEY O. BANKS
Director of Water Resources

By /s/ Paul L. Barnes
Chief, Division of Administration

APPROVED:

Director of Finance

AMENDMENT TO
AGREEMENT BETWEEN THE DEPARTMENT OF WATER
RESOURCES AND THE STOCKTON AND EAST SAN
JOAQUIN WATER CONSERVATION DISTRICT

This amendatory agreement made and entered into as of October 2, 1956 by and between the Department of Water Resources of the State of California, hereinafter referred to as the Department, and the Stockton and East San Joaquin Water Conservation District, hereinafter referred to as the District.

W I T N E S S E T H

WHEREAS the Department and the District entered into a cooperative agreement as of October 1, 1956 for the measurement of surface and underground waters and a water quality check in the Calaveras River area and a report on the results thereof, and

WHEREAS the District agreed to deposit with the State $1,000.00 for expenditure by the Department in performance of the work provided for in said agreement, and

WHEREAS the agreement provides that the $1,000.00 shall be returned to the District unless the Director of Finance approves transfer of said $1000.00 into the Water Resources Revolving Fund within thirty days to pay for the work provided for in said agreement, and

WHEREAS the parties desire to eliminate the time limit for approval by the Director of Finance of the transfer of the deposit.

NOW THEREFORE, it is mutually agreed that the agreement is amended by the deletion of the following paragraph:

> "If the Director of Finance, within thirty (30 days) after receipt by the Department of said One Thousand Dollars ($1,000) from the District, shall not have approved the deposit thereof into said Water Resources Revolving Fund, together with the transfer of the sum of said One Thousand Dollars ($1,000) from funds made available to the Department, for expenditures by the Department in performance of the work provided for in this agreement, such sum contributed by the District shall be returned thereto by the Department."

Except as amended hereby all other terms and conditions of said agreement are to remain in full force and effect.

Approved as to Form and Procedure

/s/ Irving L. Neumiller
Attorney for Stockton and East San Joaquin Water Conservation District

STOCKTON AND EAST SAN JOAQUIN WATER CONSERVATION DISTRICT

By /s/ J. H. Burton
Chairman, Board of Directors

Approved as to Form and Procedure

/s/ P. A. Towner
Chief Counsel, Department of Water Resources

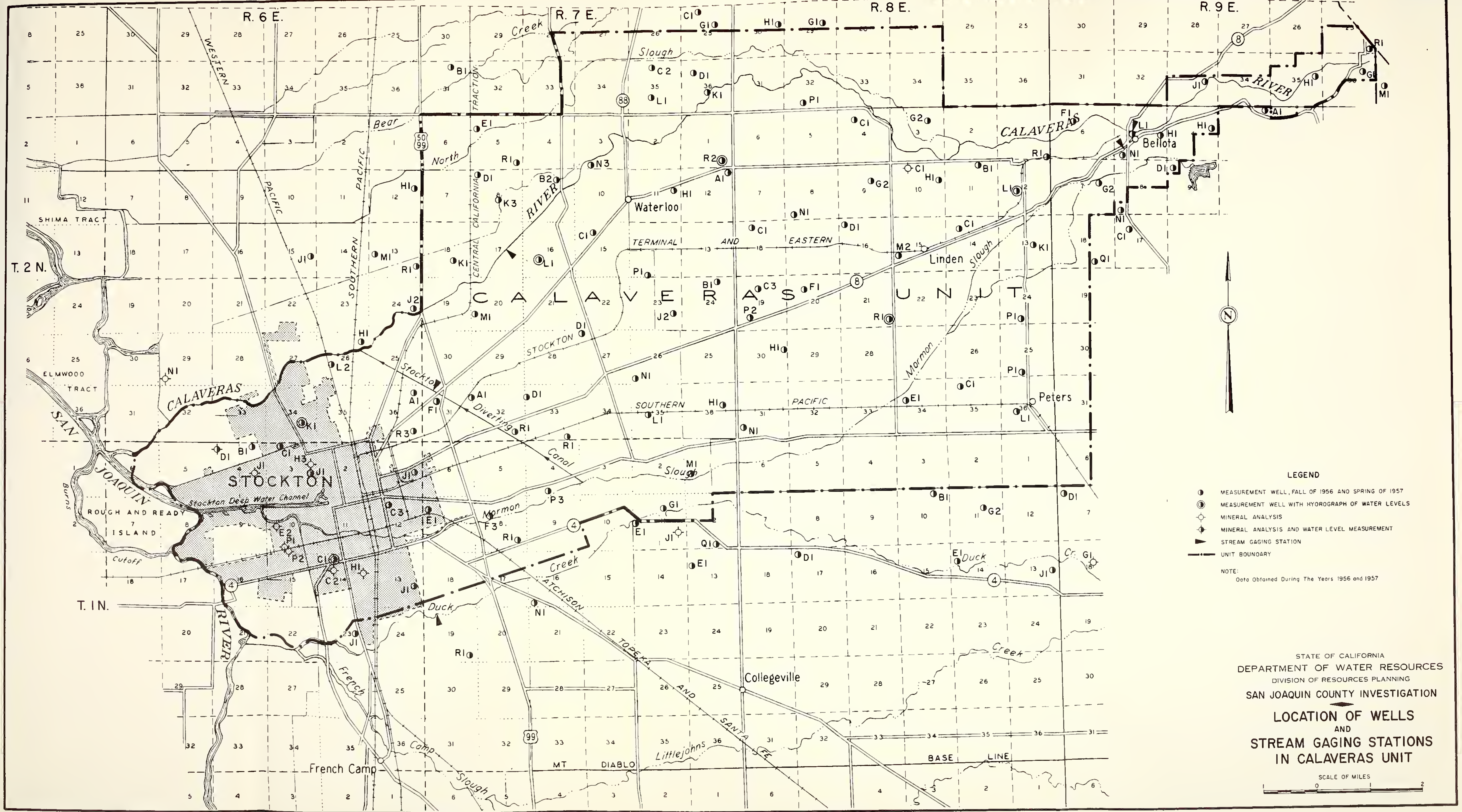
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

HARVEY O. BANKS
Director of Water Resources

By _____
Division of Administration

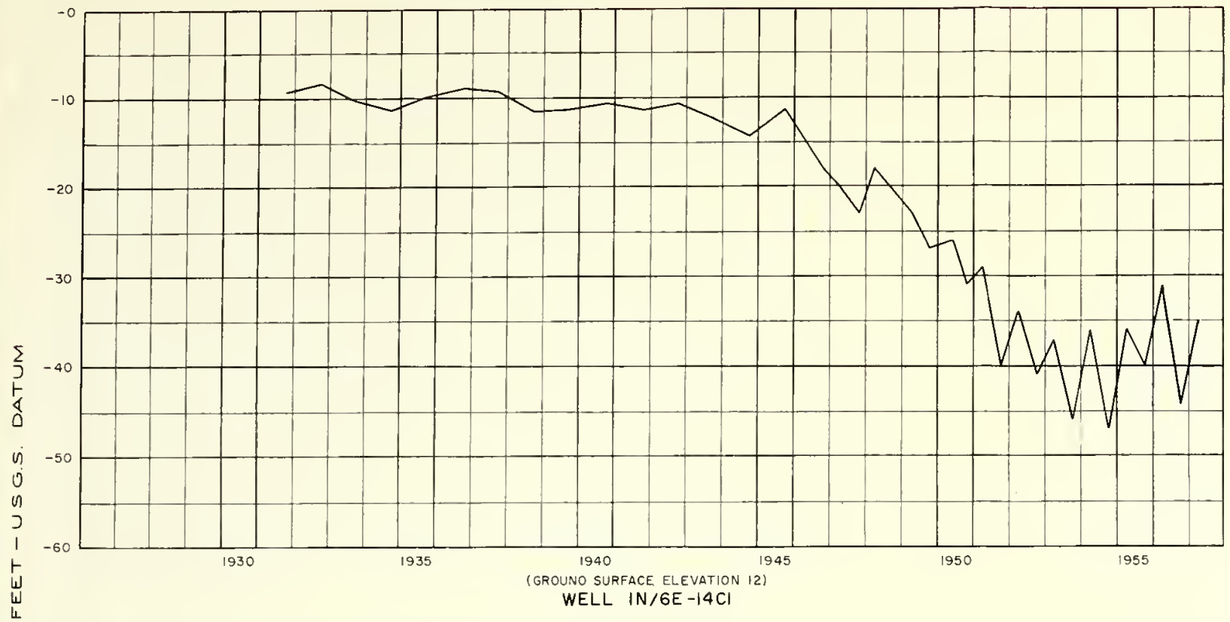
DEPARTMENT OF FINANCE
APPROVED
January 8, 1958
John M. Peirce, Director

/s/ Louis J. Heinzer
Administrative Adviser

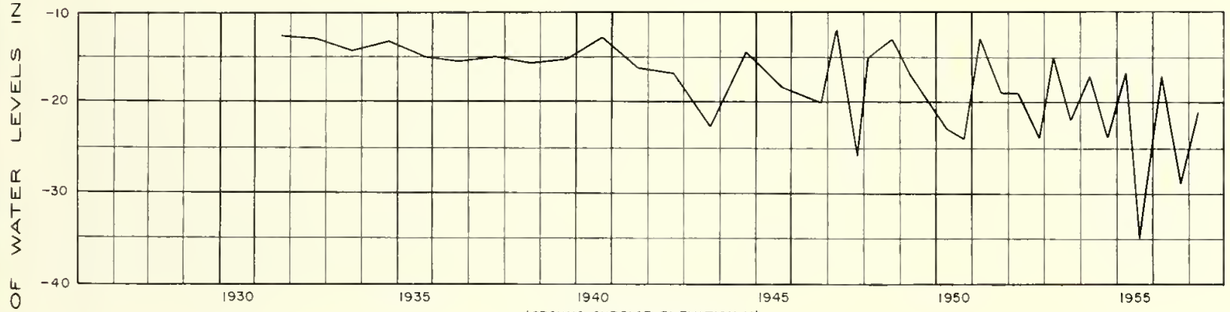


DEPARTMENT OF WATER RESOURCES 1957

ELEVATIONS OF WATER LEVELS IN FEET - U.S.G.S. DATUM



(GROUND SURFACE ELEVATION 12)
WELL 1N/6E-14C1



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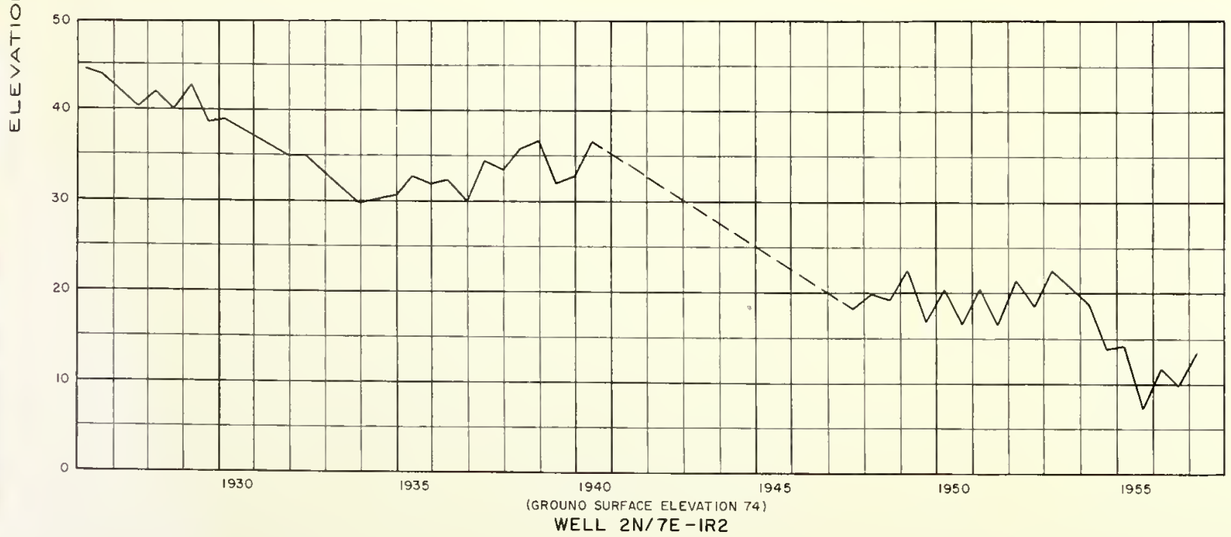
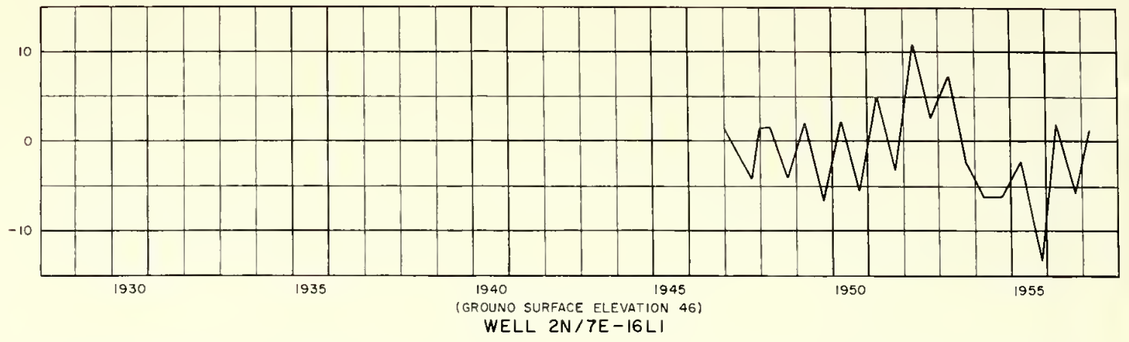
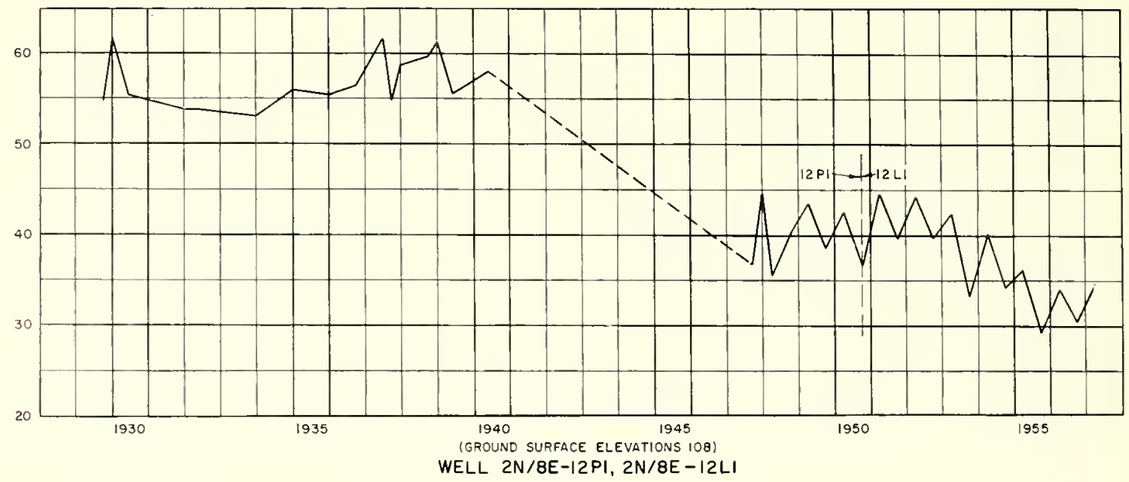
WELL 2N/6E-34K1



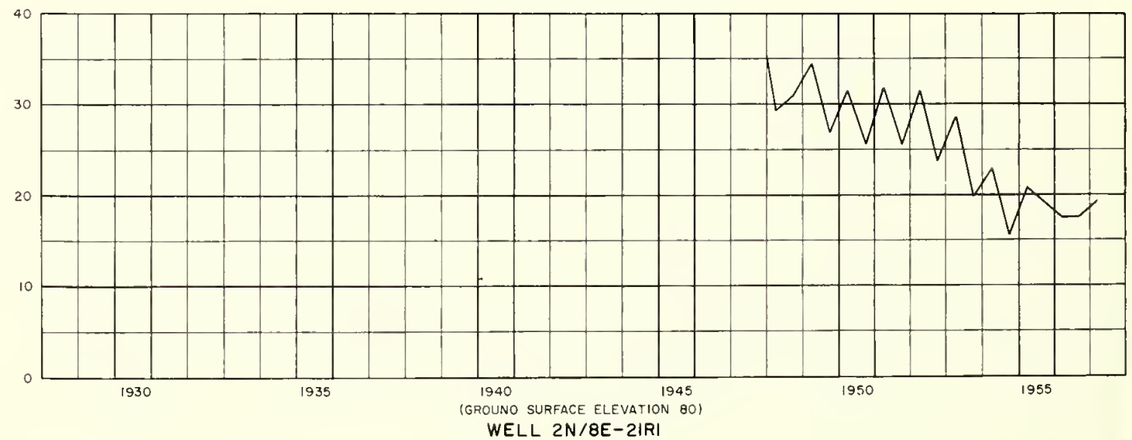
(GROUND SURFACE ELEVATION 74)
WELL 2N/7E-1R2



(GROUND SURFACE ELEVATION 46)
WELL 2N/7E-16L1



(GROUND SURFACE ELEVATIONS 108)
WELL 2N/8E-12P1, 2N/8E-12L1



(GROUND SURFACE ELEVATION 80)
WELL 2N/8E-21R1

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
DIVISION OF RESOURCES PLANNING
SAN JOAQUIN COUNTY INVESTIGATION

ELEVATIONS OF WATER LEVELS IN SELECTED WELLS IN CALAVERAS UNIT